TREES MAGAZINE

Lobel Maple (Acer Lobeli) As a Narrow Tree On a Street in Hilversum, Holland

33rd Meeting N. J. Fed. of Shade Tree Commissions – Atlantic City, Nov. 16-17-18

Dutch Elm Disease and Related Troubles of Elm *Richard J. Campana*

A Program for Street Trees *Orin F. Nolting*

Sept.-Oct., 1958 *The Journal of American Arboriculture* Vol. 18—No. 6

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ALONG THE WAY With .... EDW. SCANLON

■ I am the VERY HAPPY OWNER of a LOVELY OIL done by GILBERT SKUTT. It came as a VERY PLEASANT and UNEXPECTED GIFT on Aug. 11. The scene is one GILBERT DEVELOPED while he was SUPT. OF PARKS AT PASADENA (later at Los Angeles —now retired) a long time ago—it shows EUCALYPTUS TREES IN THE ARROYO SECO (thats where the ROSE BOWL is located). The boy can SURE TOSS the old paint around, BUT GOOD —I can toss it around too but ALL I GET OUT OF IT is a BETTER LOOKING BARN. Many THANKS GILBERT, your fine work is hanging in an HONORED SPOT at THE RANCHO.

■ **FOUND A GLADIOLUS, in an assorted bunch, we planted at the Rancho this spring, that is the MOST BEAUTIFUL thing—I think it is the MOST BEAUTIFUL FLOWER I'VE EVER SEEN: that is SHORT OF A TREE FLOWER. The color is GRAY SHADED ORCHID with an ORCHID PINK THROAT. I suppose it is a WELL KNOWN and NAMED VARIETY but it certainly is an ODD AND EXQUISITE color. Gotta get more.**

■ **To go a BIT FURTHER with DUTCH ELM DISEASE we would like TO QUOTE a statement of Dr. Curtis May "THERE IS NO HOPE NOW THAT THE DISEASE CAN EVER BE ERADICATED" (Pg. 62—Proceedings 29th N. S. T. C. 1953)—"Ever" we all know is a long time, but FIVE YEARS LATER that statement is AS SOUND or MORE OMINOUS, than it was in 1953. In fact, THE INTENSITY AND DISTRIBUTION OF DED has spread CONSIDERABLY.**

■ ANOTHER STATEMENT by DR. MAY, in the same paper, bears repetition. This concerns THE FORM OF THE BUISMAN ELM—"It does not have the form of the American elm. It is more upright with less wide spreading branches in the top." IN OTHER WORDS PYRAMIDAL. This is as WE HAVE STATED here numerous times and is CONTRARY TO SOME NURSERY DESCRIPTIONS. We think it is a VASTLY SUPERIOR form than the American elm for many MORE STREET SITES—LESS TROUBLESOME by far and by far MORE FUNCTIONAL. Botanically it is "ULMUS CARPINIFOLIA BUISMAN."

■ **We are VERY HAPPY to learn that GRETCHEN HARSHBARGER, Garden Editor of HOUSEHOLD MAGAZINE was awarded the 1958 ASTA PROFESSIONAL WRITERS AWARD. The trophy was presented by TRUE D. MORSE, UNDERSECRETARY OF AGRICULTURE. A worthy recipient.**

■ Wouldn't you know I'd be away from the Rancho when BARBARA CHASEMORE stopped. BARBARA is the daughter of THE FRIENDS I stayed with in WOKING, ENGLAND last fall. A schoolteacher, BARBARA IS HERE ON AN EXCHANGE thing-a-ma-jig or something—she is in a school at New Jersey.

■ **In the review of FRED POTTS new book "CONCENTRATED SPRAY EQUIPMENT" we forget to mention THE PRICE—well as a matter of fact we didn't know it—IT'S 12.50 for USA sales and 13.50 FOR FOREIGN. This book is PACKED WITH INFO—all 598 pages of it.**

■ I think I MENTIONED IN MY EUROPEAN STORY the BEAUTIFUL SINGLE DAHLIA—"XMAS CHEER"——that I saw at HENRY VINKS CITY GREENHOUSE IN ROTTERDAM—We got some and they HAVE BEEN BLOOMING at the Rancho SINCE JUNE —right now they are a RIOT OF RED. What a border or SOLID BED these things WOULD MAKE.

■ **That crazy MT. ATLAS BLUE CEDAR in our yard has GROWN 31 INCHES this summer. This BEAUTIFUL TREE should BE TRIED MORE WIDELY in these parts. This one HAS STOOD 15° BELOW—not sustained, but for a week last winter we had SOME ZERO, and below, weather and it never LOST A NEEDLE. Its irregular BRANCHING HABIT makes it PICTURESQUE and much more DESIRABLE AND ORNAMENTAL than the sternly symmetrical BLUE SPRUCE.**

■ DICK CAMPANA is leaving his ILLINOIS BERTH for one at the UNIV. OF MAINE—as Professor of Botany and Head of the Department of Botany and Plant Pathology and as Plant Pathologist and Head of the Department of Botany and Plant Pathology in the Ag. Station. HOPE WE DON'T have to use all that IN ADDRESSING A LETTER it would require an EXTRA 4 CENTS. This move ALSO EXPLAINS why DICK was practicing up on the STEIN SONG at ASHEVILLE.

■ **While attending the MEN'S GARDEN CLUB CONVENTION in Cleveland LAST MONTH the GARDEN WRITERS ASSOCIATION paid the Rancho A VISIT and we BROKE BREAD—present were, Gretchen Harshbarger, Fred Rockwell, Alethea Arehart, Leon and Vera Snyder, Ray Crawford, Charlie Crawford, C. A. Weddigan, Christ Pataky Jr., Henry Pree, Paul Young, Frank Abrahamson, and Robert Schery. The EVENING WAS CHILLY AND RAINY BUT the chow on the FRONT PORCH made for a nice CHUMMY PICNIC. COME AGAIN.**

■ Here's GOOD NEWS—at LONG LAST our good friend FRANK KARPICK has been elevated to CITY FORESTER OF BUFFALO. If anyone EVER EARNED a promotion this lad did. Now GO AHEAD FRANKIE and get some MODERN TREES in that nice city of yours.

■ **EVERYONE at the N.S.T.C. IN ASHEVILLE was SHOCKED to learn of the SUDDEN PASSING of ROGER SOHNER on Aug. 21. ROGER had been planning TO FLY to the Conference when he was fatally stricken. It is just a FEW MONTHS OVER 25 YEARS that ROGER AND I met at the FIRST MEETING of the WESTERN CONFERENCE IN SANTA MONICA. He was an EARNEST WORKER in the CAUSE OF TREES and HIS PUNCH will BE MISSED. Our DEEPEST SYMPATHY goes out to Alice.**

■ It's a cinch the POSTAL RATE HIKE the WASHINGTON SLOBS shoved down OUR THROATS wasn't POPULAR—since then the INCREASE IN THE NUMBER of 3c post cards is UP CONSIDERABLY. My problem is HOW TO CONDENSE one of my LONG WINDED letters to POST CARD SIZE.

■ **Our GOOD FRIEND and ADVISORY COUNCIL member RALPH CORNELL is to be honored October 17 at the convention of the CALIF. COUNCIL OF LANDSCAPE ARCHITECTS to be held in PALM SPRINGS. The AWARD TO RALPH is in recognition of "outstanding contribution in service to community, State or nation, and for outstanding service to the profession of landscape architecture"—WELL PUT and WELL DESERVED — congratulations to the CALIF. COUNCIL.**

■ Just A YEAR AGO I was on that MEMORABLE TRIP TO YURRAP—wish I WERE BACK right now. It was NOT ONLY FUN, but very ENLIGHTENING. Every AMERICAN SHOULD MAKE such a trip—if so, I'M SURE there would be a demand for AN ACCOUNTING of where our TAX MONEY GOES—as if we don't know.

■ **The WINTER MEETING of the NEW YORK ARBORISTS ASSOCIATION will be held at CORNELL UNIVERSITY Jan. 11-12-13, 1959. A FINE PROGRAM is assured by FRANKIE KARPICK—so, what else, DON'T MISS IT.**

■ The COVER PICTURE shows a NICE STREET observed in HILVERSUM HOLLAND—ACER LOBELI—the LOBEL MAPLE. It has a NICE CLEAN NORWAY-LIKE leaf, STRIPED BARK and a neat ASCENDING FORM. Lobeli is a NATIVE OF ITALY.

■ **A HEADLINE in an ENGLISH MAGAZINE reads "IVY IS KILLING OUR TREES." They don't know how LUCKY THEY ARE, that's COMPARATIVELY EASY to combat—"IVORY IS KILLING OUR TREES."**

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The Editors of TREES invite discussions, comments and all type of literary materials pertaining to trees and tree preservation from any person engaged either in the scientific advancement or commercial development of the field.

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Sept.-Oct., 1958 **Journal of the National Arborist Association** Vol. 18—No. 6

EDWARD H. SCANLON, Editor
7621 Lewis Rd., Olmsted Falls, Ohio ADams 5-2357

"No place is complete without trees. A home without trees is charmless; a road without trees is shadeless; a park without trees is purposeless; A COUNTRY WITHOUT TREES IS HOPELESS."

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Out On A Limb

AMERICAN—VS—EUROPEAN CITIES

We cannot help but reminisce on the many things we saw in numerous European cities on our tour, at this time, last fall.

Notable of course were the many species of trees so seldom seen on American streets. Why so few of these outstanding trees have been used here is subject to much conjecture. But the fact that they have been used with distinction—for low cost maintenance—for beauty—and for reduction of storm damage certainly behooves us to reassess our practice and thinking in this all important phase of city planning.

We have proceeded blithely using forest giant types that have no earthly or sound reason for use. Every city arborist and park superintendent knows he is waging a losing battle with huge trees. Few cities can afford the budgets necessary to cope with these overgrown mounments to a past era of thoughtlessness, but still the refusal to evaluate what a tree will do from the 20th to the 40th year of its existence remains a conundrum that is very difficult to understand. It would be funny if it were not so serious and had such costly repercussions.

One of the principal reasons for these very costly mistakes has been the fact that little effort has been made by tree growers to introduce or produce good trees. Good trees, or the more desirable species are slower and more costly to grow and this does not make the cash registers tinkle as merrily as do the sales of the fast growing junk. This perfidy continues at a faster pace today with the looser easier to get dollar. The wide spread campaigns publicising the imaginary merits of "selections" of the honey locust is bound to usher in another era of trouble and high maintenance cost such as that which resulted from the short-sighted fiasco that resulted in the use of hundreds of thousands of silver maples in the past fifty years—a tree of equal large size, brittle wood, huge trunks and rampaging root systems. Sixty foot trees have little place on a huge majority of city streets as we have found to our sorrow.

If we would we could learn valuable lessons in beauty and economy from Europes centuries old experience with trees of common sense size and durable structure. You see none of these trees on European streets—for a very good reason—they don't fit and so they don't belong.

Another notable observation was the glaring cleanliness of European cities and the fine detail of park work—flower beds all over—nicely tended shrub and border plants—well cared for lawns. It made you think and it made you sick. We are the richest nation in the world in some respects. In others we are very poor. When these things are mentioned some people come up with the asinine answer that labor is cheaper there — hogwash — everything is relative. Our politicians, our people or maybe the people responsible for these refinements just haven't got what it takes. We spend money like mad, rather we waste it like mad on crazy skyrockets, which may be needed but which anyone with a half

an ounce of sense knows could be done for half the present cost. Our natural resources are taking a beating. What has been done to continue and enlarge on the shelter belt system—the system of fire control and roads in the forest so ably started under the CCC. Why couldn't the young fellows in the Army and Navy be trained in "CCC" camps and accomplish something worthwhile rather than waste this time, all of their time, on senseless military ferdugling.

Yes, it makes you wonder what make us tick and it makes you wonder if maybe the day of reckoning isn't going to be a very sad one. Don't ever kid yourself that we have everything—we have—more but not everything.

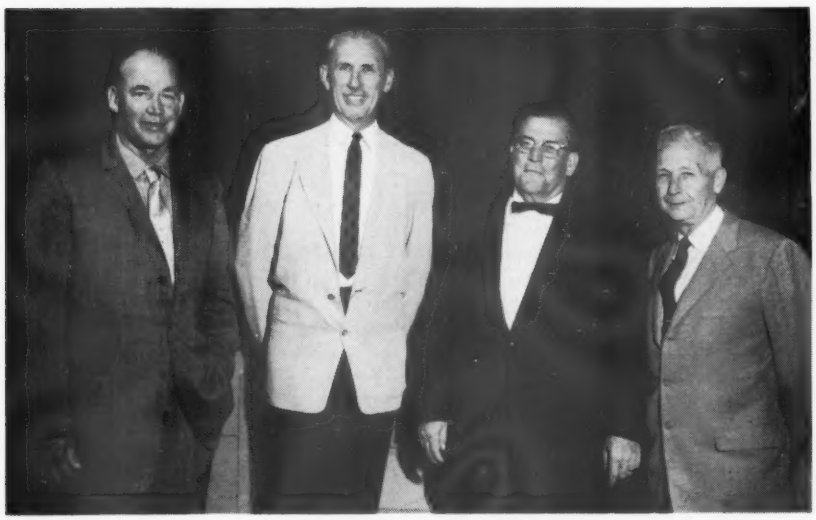
Cleveland Maple in Moscow

This picture has just been received showing the Cleveland Norway Maple planted by Editor Scanlon in Moscow's Friendship Park last Oct. 2 (1957). It's a'growin'. See Page 11 — Vol. 18, No. 3 of TREES.

Bullbay in Toledo

Joe Sweeney, City Forester of Toledo sizes up a Magnolia grandiflora which is doing quite well. It was 4' tall when planted in 1952. Was purchased in Georgia and is located at 2301 Pembertson St.

N.A.A. Officers For '59



At the recent National Shade Tree Conference in Asheville the following members of the National Arborists Association were elected to lead the organization for 1959. In the picture to the left—L. to R. Freeman L. Parr, Parr and Hanson, Hicksville, N. Y., Second Vice-President; Ray Gustin, Jr., Gustin Tree and Landscape Service, Rockville, Md., President; George T. Lewis, Lewis Tree Surgeons, Media, Penna., Secretary; Paul E. Tilford, Executive Secretary.

FOR YOUR CALENDAR

Plant Propagators Society, Wade Park Manor Hotel, Cleveland, Ohio, December 4-6, 1958.

Winter Meeting of The Ohio Nurserymen's Association, Neil House, Columbus, Ohio. January 21, 22, 23, 1959.

Winter Meeting National Arborist Association, Williamsburg, Va., February 8, 9 and 10, 1959.

Trees...

Dutch Elm Disease and Related Troubles of Elms

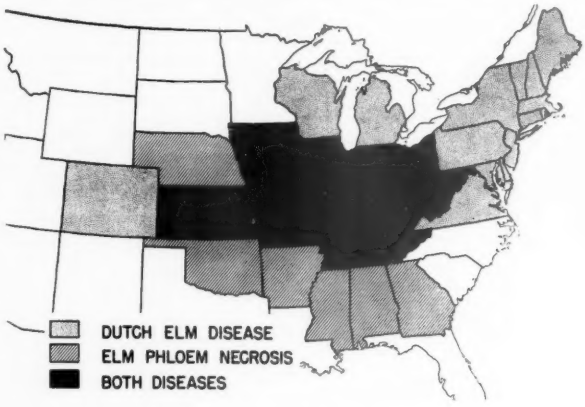
By Richard J. Campana
Associate Plant Pathologist
State Natural History Survey Division
Urbana, Illinois

As the most serious and destructive shade tree disease in the United States, the Dutch elm disease has had a most significant influence on our consideration of urban elm populations where it has become well-established. Where allowed to spread unchecked it has destroyed substantial numbers of trees. In many places its destruction has been reduced through effective control programs. Infectious diseases, insect infestations and non-infectious disorders of elms often are incorrectly attributed to Dutch elm disease. Sometimes there is but slight appreciation that other troubles of elms exist or are of any significance. Where control efforts are in operation, there is a greater awareness that elms are subject to other troubles also, that some of these troubles may be destructive in themselves and that they are of direct or indirect significance to Dutch elm disease. It is becoming more apparent that knowledge of such troubles of elms is necessary for more effective control of Dutch elm disease itself. This paper is concerned only with the similarities and differences between symptoms of Dutch elm disease and those of the more common diseases and injuries of elms, and does not include consideration of insect problems beyond the role of the insect vector of the Dutch elm disease fungus. Attention is directed to the manner and degree that these additional elm troubles influence the Dutch elm disease, and how this disease and efforts to control it may influence our consideration of these troubles.

KEY TO ELM DISEASE

1.	Sap bleeding from branch crotch or wound	WETWOOD
2.	Sap not bleeding, at least without wounding	2
	2. Leaves discolored yellow throughout tree	3
	2. Leaf discoloration varied and localized	6
3.	Inner bark yellow to butterscotch in color	4
3.	Inner bark white to tan in color	7
	4. Inner bark with wintergreen odor	PHLOEM NECROSIS
	4. Inner bark without wintergreen odor	5
5.	Sapwood discolored with brown streaks	6
5.	Sapwood white without discoloration	DROUGHT
	6. Sap with strong rancid odor	WETWOOD
	6. Sap without rancid odor	WILT
7.	Sapwood discolored with brown streaks	8
	8. Sap with strong rancid odor	WETWOOD
	8. Sap without rancid odor	WILT
9.	Sap bleeding from limb, on wounding	WETWOOD
9.	Sap not bleeding from limb, on wounding	DROUGHT

Figure A



States in which Dutch elm disease, phloem necrosis, or both, have been known to occur.

The Nature of Dutch Elm Disease

Dutch elm disease is caused by a fungus known technically as *Ceratocystis ulmi*. The fungus is spread primarily by elm bark beetles but may be transmitted from diseased to nearby healthy trees through root grafts. The fungus grows and reproduces and the bark beetles breed between the bark and wood of dead and dying elm trunks and branches. The beetles infect healthy trees by feeding in the small twig crotches, infected trees attract more beetles for breeding and the disease circle continues. Dutch elm disease is a major shade tree problem for the following reasons. It cannot be prevented from spreading over wide areas; all species and varieties of elms (European, Asiatic and American) are suspectible to it to some degree; for trees affected there is no known cure; in the American elm, the most widely distributed and valued elm species, there is little if any resistance to it; it is the most susceptible of all elm species; it is the most abundant shade tree in urban areas; and most urban elm plantations include identical or similar genotypes. In spite of adverse factors the disease can be kept to low levels within local areas, and such control is sound economically.

Diseases with Symptoms Suggesting Dutch Elm Disease

There are four other diseases and one other trouble that result in symptoms similar to those of Dutch elm disease. These are: phloem necrosis; wetwood; wilts caused by the *Verticillium* and *Dothiorella* fungi; and drought. Elms are suspected of Dutch elm disease if one or more branches are wilting. In the most incipient stage of wilt, as the wilting leaves curl upward their undersides are exposed giving the impression of a dull gray-green cast, no other discernible discoloration being evident. This is the most difficult state of the disease to separate from other closely related diseases in the field. In an effort to obtain a rapid field diagnosis of such diseases the key 2 shown in Figure A to these diseases, was prepared. As the tree is examined initially, it is observed for any evidence of sap bleeding from a branch crotch or wound (Key: 1). Such evidence is a positive indication that the tree has wetwood, but in no way limits the diagnosis to wetwood alone, nor is absence of such evidence conclusive that the tree is free of wetwood.

Discoloration of the leaves in the tree are then noted (Key: 2) with respect to distribution. If leaf discoloration is yellow and somewhat general throughout the whole foliage, *Wetwood, Phloem Necrosis* or *Drought* could be responsible, and only *Wilt* diseases (of which *Dutch Elm Disease* is one) are not considered possible here. If examination of the inner bark of buttress root shows it to be yellow to butter-

scotch in color, either *Phloem Necrosis* or *Drought* is possible (Key: 3), but if the discolored inner bark has a wintergreen odor the diagnosis is definitely *Phloem Necrosis* (Key: 4); without the odor diagnosis of *Phloem Necrosis* is not warranted. In such a case the sapwood is then examined for streaking (brown, black, blue or gray) (Key: 4). In the complete absence of streaking the trouble is diagnosed as *Drought* (Key: 5). If on the other hand, streaking is present in the wood, the disease may be *Wetwood* or one of many *Wilt* diseases (Key: 6). If the sap has a strong rancid odor *Wetwood* is present here, but in absence of a rancid odor the diagnosis is *Wilt*. The presence of *Wetwood* associated with streaking does not preclude absence of a *Wilt* disease, and all trees with streaking must be sampled for possible confirmation of *Wilt* disease by laboratory culture.

Referring back to Key: 3, if the inner bark of buttress roots is white to tan in color, only *Wetwood, Wilt* or *Drought* are possible causes of trouble. Sapwood with streaking may mean *Wilt* or *Wetwood;* without streaking it may mean *Wetwood* or *Drought* (Key: 7). Streaked wood and sap of rancid odor signifies *Wetwood;* streaked wood and sap without odor signifies *Wilt* (Key: 8), Sapwood without streaking and sap bleeding from limb on wounding is diagnosed as *Wetwood;* if bleeding of sap does not occur the diagnosis is *Drought.*

Symptom Differences Between Wilt Diseases

There is no method by which the wilts can be positively diagnosed from one another without a culture of the causal fungus. However, one or the other of the three wilt diseases is sometimes indicated by specific signs or symptoms.

Infection by the *Dothiorella* and the Dutch elm disease fungi begins in the branches in most cases, whereas infection by the *Verticillium* fungus, which is soil-borne, begins in the roots. Accordingly, absence of sapwood discoloration in terminal branches that are wilted, but its presence in larger, older sapwood suggests Verticillium wilt, rather than either of the other two fungus causes of wilt. Since elms generally exhibit considerable resistance to the Dothiorella and Verticillium wilt fungi and almost none to the Dutch elm disease fungus, fragmentary discoloration, visible as spots in annual wood rings two or more years old, is more indicative of Dothiorella or Verticillium wilt, than of Dutch elm disease. In addition, the Dothiorella wilt fungus produces elliptical cankers on stems affected and fruiting bodies appear as small black specks within or near the

COMPARATIVE ASPECTS OF COMMON ELM DISEASES AND ENVIRONMENTAL TROUBLES

Disease or Injury	Type of Causal Agent	Signs, Symptoms or Injury	Tissue Initially Affected	Control
Dutch elm disease	Fungus	Wilting branches; discolored sapwood	Branch sapwood vessels.	Sanitation; Dormant DDT spray
Elm phloem necrosis	Virus	Discolored foliage; butterscotch phloem; wintergreen odor	Bark vessels.	Foliar DDT spray.
Wetwood of elm	Bacterium	Wilting branches; bleeding fermented sap; dieback.	Heartwood of large branch crotches.	Drainage of sap; feeding; pruning.
Verticillium wilt	Fungus	Wilting branches; discolored sapwood	Root sapwood vessels.	Feeding: pruning.
Dothiorella wilt	Fungus	Wilting branches; discolored sapwood. cankers; fruiting bodies; dieback	Branch sapwood vessels.	Feeding; pruning.
Elm leaf spot	Fungus	Spotted dying of leaf tissue; defoliation; fruiting bodies.	Interveinal leaf tissue.	Foliar spray with fungicide of organic mercury type.
Scorch	Heat; desiccation (temporary)	Yellowing and browning of interveinal and marginal leaf tissues; defoliation.	Interveinal leaf tissue.	Watering; shading; feeding.
Drought	Heat; desiccation (prolonged)	Wilting branches; dieback; defoliation.	Entire foliage; individual branches.	Watering; feeding; shading.
Dieback	Site disturbance; pavement, cuts, fill, soil compaction	Yellowing and defoliation of terminal leaves; dieback; sprouts on heavy wood.	Fine roots.	Feeding; watering; aerating; pruning.
Chemical injury	Weed killers (2, 4 D type)	Distortion of leaves and stems; folding, curling or twisting; yellow discoloration of tissue.	Most succulent tissues in terminal leaves and shoots.	Water thoroughly.

COMPARATIVE ASPECTS OF COMMON INSECT PESTS OF ELMS

Mite or Insect Pest	Signs, Symptoms or Inury	Tissue Initially Affected	Control
Spring cankerworm	Holes in leaves; defoliation.	Leaves	Delayed dormant or early foliar DDT spray
Leaf beetle	Holes in leaves; defoliation.	Leaves	Dormant or foliar DDT spray
Scale (Scurfy, European, Putnam)	Branch dieback.	Bark of branches	Dormant DDT spray, (oil added for Putnam scale)
Aphids	Honeydew; yellowing of leaves; sooty mold.	Leaves	Foliar malathion spray
Mites	Yellowing of leaves.	Leaves	Foliar spray; Aramite, malathion, chlorobenzilate
Borers	Raised bark; tunnels; death of bark.	Inner bark and cambium	Removal of insests; wrapping trunks; fumigation with carbon tetrachloride.
Bark beetles	Frass around holes in bark; galleries, pin holes in bark.	Inner bark and cambium	Dormant DDT spray
Leafhoppers	Marginal or interveinal necrosis	Leaves	Foliar DDT spray

edges of such cankers. Neither Dutch elm disease nor Verticillium wilt produces cankers or fruiting bodies in such a manner.

In its intermediate stage Dutch elm disease can almost always be differentiated from all other troubles by a progressive pattern of foliage symtom development over the whole tree. Typical discoloration is always associated with distortion of the leaves by wilting, and involves a progression of color changes from dull gray-green, through yellow and finally brown. Once an elm begins to show such symptoms, wilting and discoloration soon becomes evident in many different branches, in varying degrees. None of the symptoms of the other diseases, including wilts, occurs in this way. Except for phloem necrosis, most other diseases either affect only a portion of the tree and no more, or the degree and speed with which other portions of the trees are affected is not sufficiently marked to warrant a discernible deterioration of the whole tree. In contrast the influence of Dutch elm disease on a tree is conspicuous, progressive, and clearly effective. Although the foliage symptoms of Dutch elm disease and phloem necrosis are in some respects similar and indistinguishable, differences in symptoms of tissues affected make accurate separation of these two diseases in the field possible.

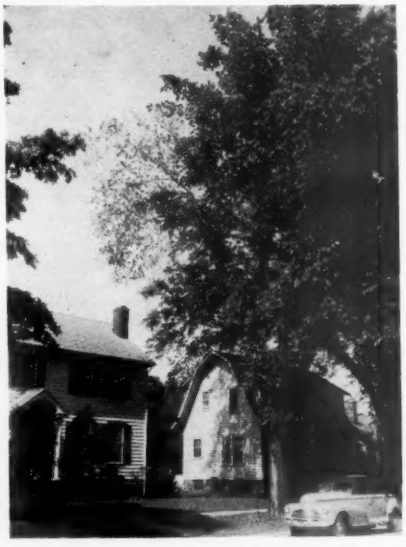
Diseases and Injuries Not Indicative of Dutch Elm Disease

Dutch elm disease is unnecessarily confused with other disturbances of elms, whose typical signs or symptoms do not suggest this disease. Some of the more common of these include elm leaf spot, scorch, dieback, chemical injury and decay. All of these troubles are indicated to some degree by yellowing of leaves, as are many insect injuries (Table 2). Yellowing of leaves in itself, however, is so common to so many diseases and other troubles that it has no peculiar significance to any one of them, and must be supplemented by additional symptoms to be of value for an accurate diagnosis.

Elm leaf spot caused by the fungus *Gnomonia ulmi* occurs as a multitude of infections spotted over the leaves, and first becomes evident by yellowing of leaf tissue in spots. As the center of the yellow spot dies it becomes brown, and then black as pinpoint size black fruiting bodies appear. Leaves with large numbers of infections fall prematurely and accumulate in great numbers beneath infected trees. Fortunately, the injury to affected trees in most cases is slight unless the condition is recurrent annually for several years, and control is easily achieved by destroying infected leaves and spraying to prevent infection.

Scorch of elm and other trees is a condition characterized in yellowing, browning, and defoliation of leaves by a temporary and often sudden deficiency of water. This condition occurs when excessive atmospheric drying from heat or wind results in loss of water from foliage of the tree at a rate faster than that by which it can be absorbed from the soil. This phenomenom is often referred to as mid-summer leaf drop throughout the Midwest. Though it may be alarming at times, generally its damage is slight and of a temporary nature. Although it may be indicative of inadequate soil moisture reserves, and thus a forewarning of an impending drought, it is differentiated from genuine drought by its suddenness, its frequent annual occurrence in the Midwest and by its temporary or relatively non-injurious nature.

Secondary stage of D. E. D. Most of leaves which wilted first, have fallen from branches.



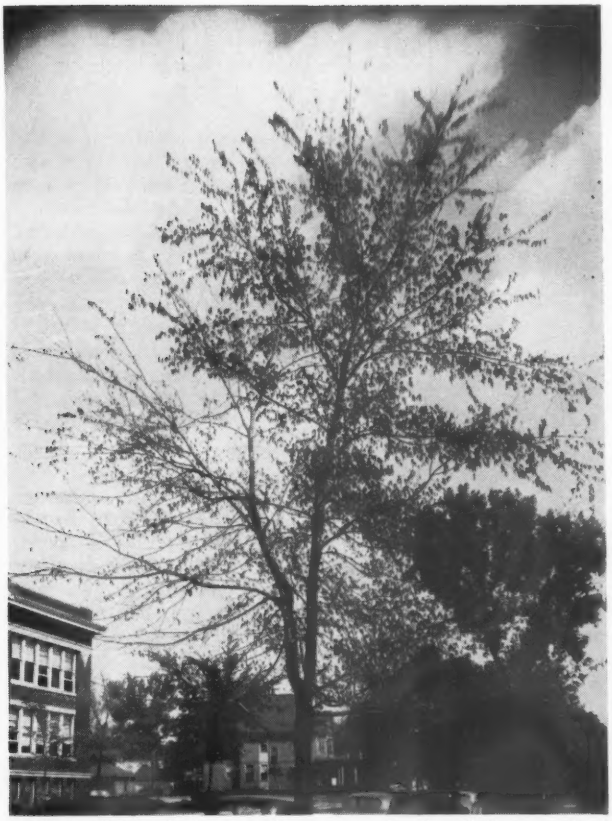
First indication of D. E. D. is wilting of foliage on one or more small branches.

Fruiting body of fungus indicating decay of heartwood.

Dieback of terminal branches of elms and other trees is a condition becoming more and more common as a result of soil disturbances and overcrowded growing conditions for urban trees. Trees in urban populations, which have been up to now in the full vigor of their earliest years of development, are beginning to become major maintenance problems as they outgrow the limits of their allocated space. In addition, the encroachment of artificial impediments into zones of root development, by such means as: parking lots, street widenings, curb settings, and concrete walks and driveways serves to weaken community trees and contributes to serious problems of water deficiency, insect infestation, and disease. Dieback of branches in most cases is a reflection of the loss of a portion of the root system as a direct result of soil disturbance from cuts, fills, encroachment on root space, lowering of water tables, prevention of water absorption by pavement, or compaction by heavy machinery.

Distortion and discoloration of leaves and succulent stems from accidental or deliberate treatment with herbicidal chemicals such as 2,4,-D or with excessive dosages of non-herbicidal materials have been of much concern lately. In typical cases affected branches show leaves curling downward, enclosing the under-surface with the upper surface exposed. This type of distortion is characteristic of injury of elm leaves by 2, 4-D or closely related herbicides. In addition most direct leaf injury is terminal and unaffected leaves lower on the stem will, in many cases, appear normal. If the injury occurs early in the season and a new growth develops, the new growth will in most cases either be normal, or but slightly distorted and discolored, indicating the latent but decreased effect of the chemical absorbed. In either case, the contrast between the

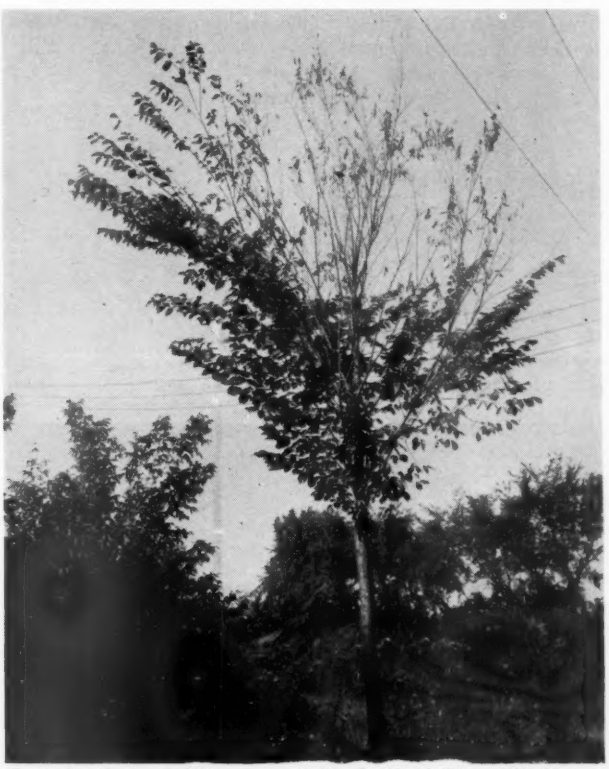
(Continued on Page 10)



Typical wilting of elm by phloem necrosis; the whole tree wilted simultaneously.

Typical wilting of foliage caused by bacterial wetwood infection of the sap.

Extreme dieback caused by drought; when first affected leaves on individual branches wilted.



Typical wilting of foliage caused by the Verticillium wilt fungus.

growth to which the chemical was applied and that occuring later will be marked.

Decay of elm wood, often conspicuous by fruiting bodies of wood-rotting fungi, is not related in any way to Dutch elm disease. Its occurrence in the heartwood of living trees only indicates that the tree has become infected and may be weakened mechanically in its resistance to windthrow and storm damage. Heartrot does not even appear to affect the physiological functioning of the tree so that a tree so affected would not be any more liable to bark beetle or borer infestation than a tree without decay. The appearance of fruiting bodies of wood decaying fungi on secondary branches of the tree indicates that the wood in which the fungi may be growing has been dead for a year or more. The presence of such fungi also indicates that the branches have been mechanically weakened for some time and may be expected to break and fall at any time.

Relation of Dutch Elm Disease to Other Elm Disturbances

The Dutch elm disease is related to all troubles of elm that may weaken the tree sufficiently to make invasion of the tree possible by elm bark beetles, the carriers of the disease fungus. These troubles are tabulated in Table 3. With the exception of leafhoppers and decay, all factors listed are considered to have a real or potential adverse influence on the health and vigor of elms, and thus to increase the incidence of the disease. The incidence of the disease is directly proportional to the bark beetle population. Therefore, the strongest influence toward an increase in the disease is the breeding of the additional bark beetles. Next in importance are phloem necrosis, drought, dieback and activity of borers. Phloem necrosis plays a most significant role in increasing the incidence of Dutch elm disease because of its widespread occurrence at epidemic levels. It provides tremendous volumes of elm material in which the bark beetles can breed. Drought, also, when it occurs over extensive areas may result in excessive increases in bark beetle populations. Because dieback of elm branches is becoming more common each year, the accumulation of elm branches partially dead in mature elms is a maintenance problem that many municipalities have found it difficult to keep pace with removal of dead or weakened branches. And finally, the presence of borers in newly-established trees in a weakened condition, further weakens such trees providing for invasion by bark beetles.

Depending on the frequency and severity with which trees are adversely affected, wetwood, the wilt diseases, and scale insects can be expected to provide conditions favoring increase of bark beetles. It is not likely in most cases that elms will be sufficiently weakened in a single season by leaf spot, scorch, cankerworm or leaf beetle to allow invasion by bark beetles. For that reason they should not become breeding hazards for the beetle, particularly since these conditions either are temporary or can be easily controlled.

Concerning the influence of the Dutch elm disease toward increasing other elm disturbances, only bark beetles, borers and dieback would appear to be affected. The stimulation of greater populations of elm bark beetles is of course the heart of the problem with which the municipality must contend. Actually, if none of these other elm troubles contributed to increase of Dutch elm disease, it would not be long before the Dutch elm disease in itself would create sufficient bark beetle breeding material to accelerate its increase. Nevertheless, where control of the disease is seriously attempted, all of these contributing factors must be recognized for success. And, because of the lethal and epidemic nature of phoem necrosis, efforts to control Dutch elm disease are not warranted at all unless equally adequate measures are taken to control phloem necrosis.

1. The writer acknowledges the aid and advice of Dr. L. L. English, Entomologist of the Illinois Natural History Survey for evaluation of the role of the insect pests as related to Dutch elm disease as tabulated in Table 2.

2. Campana, R. J., A Layman's Method of Diagnosing Tree Troubles. Proc. Fifteenth Ann. Educ. Conf., Mid. Inst. of Park Exec.: 21-27. 1956. Photos courtesy — Illinois Natural History Survey.

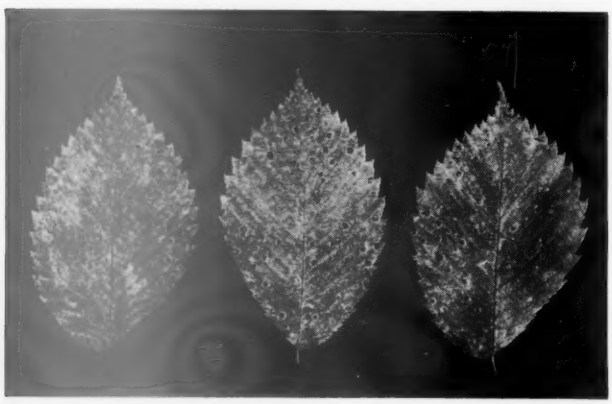
RELATION OF INCIDENCE OF DUTCH ELM DISEASE TO OTHER ELM DISTURBANCES

Type of Disturbance	Increases DED	Increased by DED
Phloem necrosis	++	—
Wetwood	+	—
Verticillium wilt	+	—
Dothiorella wilt	+	—
Leaf spot	+'	—
Scorch	+'	—
Drought	++	—
Dieback	++	+
Decay	—	—
Cankerworm	+'	—
Leaf Beetle	+'	—
Scale	+	—
European	+	—
Scurfy	+	—
Putnam	+	—
Aphids	+	—
Mites	+'	—
Borers	++	++
Bark Beetles	+++	+++
Leafhoppers	—	—

Meaning of symbols: positive sign indicates definite adverse effect; negative sign indicates no effect; +' indicates slight conditional or dubious effect.

Table 3

Typical streaking caused by bleeding of infected sap exuding from pruning wounds and branch crotches.



Typical infections caused by elm leaf spot fungus; note yellow halos of tissue surrounding black centers.

PLANT AMERICA — WISELY

Saving The Lindens On Bahnhofstrasse

(Reprinted Courtesy the Rohm & Haas Reporter)

The main street in Zurich, Switzerland, is Bahnhofstrasse. It runs from Lake Zurich on the eastern edge of the city, through the business district and west to the Bahnhof—the railroad station on the bank of the River Limmat. The street is shaded on both sides by beautiful linden trees which for many years, have been highly prized by the city. This "avenue of lindens," however, has recently been struggling for existence. Along the Bahnhofstrasse, as well as elsewhere in Zurich and in other cities and towns in Europe, the trees have been under massive attack by the linden tree spider mite. These tiny arachnids suck the life from the leaves which then turn a sickly yellowish-green color and drop off. Thus the trees are robbed of their beauty and vitality.

In the forests, the linden trees are seldom damaged by spider mites, but the pests seem to thrive without restraint in the environment of cities and towns. Here the infestations are increasing at an alarming rate.

A Difficult Problem

In Zurich for the past several years the lindens (also known as limes, although they are not related to the citrus tree of that name) have been so seriously affected by the mites that spraying with a miticide has been considered essential to save the trees. The application of spray to large trees along a busy street, however, presents many problems —esthetic as well as practical. For example, a spray would be objectionable if it left unsightly deposits on foliage, buildings, windows or automobiles. Also, it must not be obnoxious in odor, nor dangerous to people or animals. It should be free from phytotoxicity—killing mites without damaging the leaves —and not be injurious to beneficial insects. The natural enemies of the spider mite such as predatory beetles, lady bugs, flower bugs and Typhlodromid mites should not be destroyed by the miticide. Furthermore, the spray should not be harmful to birds or bees. Safety to bees is particularly important in spraying lindens, for when the trees are in full bloom, bees swarm to the nectar-filled flowers.

Finally—and a most important point on the Bahnhofstrasse — the miticide should have long-lasting residual action. Several generations of mites develop each summer, but repeated spraying on the heavily-travelled artery would be both costly and difficult. A product was needed that would provide adequate control in a single application of spray, made early in the summer.

The trees shown at this intersection on Bahnhofstrasse were included in the test application of Kelthane spray and remained free of mite damage all summer.

Spraying the Lindens with Kelthane. The miticide was applied after midnite to avoid heavy traffic.

Kelthane Selected

The authorities at Zurich did not find any of the established miticides, such as were then used on agricultural crops, a product that would meet all these requirements. They then brought the problem to Dr. R. Maag, Ltd., Dielsdorf—near Zurich—and last year this firm was able to offer a promising solution.

Maag Company has been producing chemicals for crop protection and wood preservation for more than sixty years, and is a recognized authority on agricultural pesticides. When Maag was consulted on the spider mite problem, it was already working with Kelthane EC, a miticide which Rohm & Haas Company had developed in its Bridesburg, Philadelphia, Research Laboratory. Maag had found that Kelthane is effective against spider mites and other mites on fruit trees, vines and ornamentals, and it had evidence that the product is highly specific in its action. It kills phytophagous mites of many types without destroying beneficial insects. Moreover, Kelthane possesses long residual action. The almost invisible coating which forms on the leaves kills existing mites on contact, destroys new broods as they emerge from the eggs, and remains on the

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NAA NEWS

By PAUL E. TILFORD, *Secretary*
Box 426, Wooster, Ohio

N.A.A. Meeting

By PAUL E. TILFORD

The Twentieth Annual Meeting of the National Arborist Association was held Tuesday morning, August 26, during the 34th National Shade Tree Conference at Asheville, North Carolina. The morning program consisted of three discussions: Insurance Requirements of the Arborist—Oscar F. Warner, Landscape Forester, Waterbury, Conn.; Safety Pays in Dollars and Cents and Public Relations—D. E. Featherstone, Safety Supervisor, Duke Power Company, Charlotte, N. C.; and Selecting and Training Employees—Frank E. Kowalk, Farrens Tree Surgeons, Inc., Jacksonville, Florida.

Insurance

In summarizing his excellent talk on Insurance Requirements of the Arborist, Oscar Warner gave the following eleven suggestions for the reduction of insurance costs while being adequately insured:

1. You or someone in your organization should have a basic knowledge of the various forms of business insurance and how premiums are arrived at. Too many arborists know too little about insurance and buy whatever insurance the agent recommends.

2. If you do not buy the insurance personally, assign it to one person. This same person should handle the accident reports and damage claims, and direct your safety program with the help of the insurance company safety engineer. This safety program should include all foremen and meetings should be held monthly.

3. Purchase all of your insurance from one qualified agent or company representative and demand good service.

4. Consider placing your insurance with a strong, all-risk mutual company.

5. Check new employees thoroughly and, if there is any question, require a physical examination. Do not hire accident repeaters. If a man appears to be under 18 years of age, require a birth certificate.

6. Establish definite company policies and job methods. Be sure that all employees are familiar with them and that they are enforced.

7. Maintain an accurate record of all accidents and claims paid. Analyze the cause of accidents and how they could have been prevented. Use this in your safety program.

8. Insist on a yearly list and details of all claims, the amount paid if settled, and the amount of reserve on each unsettled claim. Follow up these reserves and determine whether you received any credit due when settled. Then compare this information with the Rating Bureau to determine if the correct figures were used in establishing your rates.

9. Whenever possible, register the carrying capacity of your vehicles at 1500 lbs. This gives a substantial reduction in automobile liability insurance costs.

10. Check the various classifications under which you are reporting. It is quite possible that certain phases of your work can be place in a lower classification. Break down your payroll to show the amount in each classification.

11. Lastly, buy comprehensive coverage. It is the cheapest form of adequate insurance for the average arborist.

Safety

In discussing safety, Mr. Featherstone pointed out that the heart of a good safety program consists of accomplishing four things:

1. Careful planning of a job by supervision.

2. Inspecting and keeping equipment in good condition.

3. Proper supervision while the job is under way.

4. Reasonable care by all employees while the work is being done.

Where these four essentials of safety are fully understood and carried out, accidents will be reduced and the results inevitably will be safer and happier employees, better service to customers, greater efficiency on every job, improved supervision, better public relations and finally, a better business organization all around.

There is no profit in accidents but there is profit in preventing them. Safety does pay. It is the only thing in a highly competitive society where everybody wins and nobody loses. It pays in dollars and cents and public relations.

Selecting and Training Employees

In concluding his talk on Selecting and Training Employees, Frank Kowalk said: I would like to point out that we believe the Foreman Hiring Program will work out best if, and only if, the evils of this program are corrected. The central office, through the Area Managers, must set a good hiring program and must, through the Area Managers, properly train and work with the Foremen so that they will thoroughly understand this program and so that they will thoroughly understand the type of person in whom we are interested in hiring.

You must show the foreman that he has your backing and that you have great confidence in his ability to select the type of men you want, then he will make great efforts to prove this confidence.

In the selection of the employee we try to select men between the age of 18 and 21, high school graduates if possible, and in good health, even though a number of these men will be drafted into the armed services, many of them will return and make excellent employees. The older family man, even though willing and qualified, usually will not last because of financial problems.

We believe that training schools are helpful but are costly. We believe that the best school prospect is a man who has had 2 to 4 months field experience with the company. There are many good men avaliable and they can be selected and trained to further every Utility Forestry Company.

Officers Elected

At the business meeting the following National Arborist Association officers were elected for the coming year: President, Ray Gustin, Jr., Gustin Tree and Landscape Service, Rockville, Md.; First Vice-President, James T. Turner, Turner Tree Service, Atlanta, Ga.; Second Vice-President, Freeman L. Parr, Parr & Hanson, Hicksville, N. Y.; Secretary, George T. Lewis, Lewis Tree Surgeons, Media, Pa.; and Treasurer, Ernest J. Chase, Chase Tree Service, Keene, N. H. Henry Vaughn Eames becomes Immediate-Past-President.

Two new members elected to the Board of Directors are: John Z. Duling, Duling Tree Experts, Muncie, Indiana and Edwin E. Irish, Chas. F. Irish Company, Cleveland, Ohio. F. L. Dinsmore, Dinsmore Tree Service, St. Louis, Mo., is a continuing member of the Board.

Anniversary Dinner

The dinner Tuesday evening was in commemoration of the 20th Anniversary of the founding of the National Arborist Association. Sixteen of the original charter members were present

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Street Trees For The City

By John Van Kamp
Rockford, Illinois

With the Dutch elm disease swiftly enveloping Rockford, new attention is being focused on favorable shade tree varieties to replace the elms in the event the city does not take adequate steps to save them. The replacement problem is serious enough when we realize that about 52% of Rockford's shade trees are American elms, the species most susceptible to Dutch elm disease, but the problem is compounded when we discover that, of the remaining varieties, such undesirable species as box elder, soft maple, Chinese elm, catalpa and poplar make up a large percentage. It is interesting to note that a city ordinance has made it illegal to plant most of these undesirable trees on city streets.

However, many nurseries are still promoting mediocre and poor shade tree species as in generations past, for one or more of the following reasons:

1. They are reproduced easily from seed or cuttings.
2. They make a saleable tree in one or two years.
3. They transplant easily.
4. They grow fast after transplanting.

These features are an advantage to the nurseryman in growing and selling trees, but city foresters are becoming better informed and are demanding more versatile trees with special attention to ultimate size, resistance to disease, insects, and storm damage, tolerance to dust and smoke, ultimate shape or form, freedom from litter, and color of flowers and fall foliage.

The day is probably past in well-planned cities when giant forest trees will be planted along narrow streets to eventually raise or break sidewalks and curbs, clog sewers, break or damage power lines interfere with lawns, and landscapes because of shallow roots or heavy foilage, and finally confront taxpayers with proportionally higher maintenance and removal costs. Probably 90% of our shade trees in tomorrow's well-planned city will be small or medium size, that is 20 to 40 feet ultimate height to better fit the space provided for them. Large trees of desirable species will be limited to parks, boulevards, and large lawns. Even the popular, low-ranch type home of today calls for new concepts in landscaping design, including the use of lower, more compact trees preferably, in many cases, with horizontal branching habit.

A thorough understanding of the requirements and characteristics of any shade tree is essential to the intelligent selection of the proper species to plant. The planting of smaller trees along streets, for example, can eliminate many of the problems created by large trees, but can present new problems if it is not understood that some species may require early removal of lower branches to permit unobstructed vision at street intersections and adequate headroom for pedestrians and vehicles.

Gardeners with nostalgic memories of shady arches of large trees along wide streets will be pleased to note that proper, long-range forestry planning will still encourage the use of large trees of good species where adequate space permits, but will discourage the use of large trees with all their problems when used on narrow parkways where they may suffer from lack of water, nutrients, and possible severe pruning. Gardeners will also be interested to learn that smaller trees will not only lend our streets beauty by affording better proportion to the street scene, but will offer a selection of beautiful, flowering species capable of springing alive each year with vivid, spectacular color.

A partial list of tree species recommended for city planting and falling in the small and medium height classification are as follows.

1. LITTLE-LEAF LINDEN *(Tilia cordata)*—One of the best. Dense, pyramidal form is outstanding in winter as well as summer. A large tree in Europe, it seldom exceeds 35 feet under street conditions in this country. Flowers are very fragrant but inconspicuous, foliage is beautiful and the tree grows unusually well under adverse city conditions.

3. SENTRY GINKGO *(Ginkgo biloba var:)*—The Sentry Ginkgo is an upright or columnar form of the better known wide-spreading Ginkgo. The fact that Ginkgos have been living on earth for over ten million years is testimony to their amazing resistance to disease and insect pests. The leaves are small, fan-shaped, and very picturesque. Insist on buying only the staminate (male) trees as the plumlike fruit or pistallate trees have an obnoxious odor when ripe.

4. WASHINGTON HAWTHORNE *(Crataegus phaenopyrum)* —Probably the best hawthorne of all the native and exotic types available today. This tree is of interest every season of the year—its broadly columnar crown is covered in mid-June with white flowers, the light green summer foliage turns to vivid apricot and red tones in the fall, and its tiny, bright red berries remain colorful all winter. Rarely exceeds 20 feet in height. Most hawthornes thrive in clay soils.

5. PAUL'S DOUBLE SCARLET HAWTHORNE *(C. oxyacantha Pauli)*—Probably the showiest of all hawthornes when in flower, trees are covered in early June with bright scarlet, double flowers. This tree's pyramidal form and 20 foot height make it an ideal street tree or lawn specimen.

6. DOUBLE WHITE ENGLISH HAWTHORNE *(C. oxya, plena)*— This hawthorne has the same pyramidal form and 20 foot height of Paul's scarlet hawthorne, but with double white flowers. This is a variety of the "May Tree" so often referred to in English literature.

7. ALDENHAM FLOWERING CRAB *(Malus var:)* — Bright cerise flowers in early May makes this one of the most spectacular of the flowering crabs. The fruit is small, hard, and the purple-red color remains effective from August to late October. Crown is rounded, foliage is dark reddish green.

8. LEMOINE FLOWERING *CRAB (Malus var:)* — This tree is prominent because it has the darkest red flower of any crab, a deep Tyrian rose. The fruit and form of this crab are similar to the Aldenham variety described above. Foliage is reddish green turning to bronze.

9. FRAU LOUISE DITTMAN FLOWERING CRAB *(Malus var:)* This crab is outstanding because it combines delicate pink double flowers, with bright green foliage, and yellow fruits on a beautiful rounded crown.

10. VAN ESELTINE FLOWERING CRAB *(Malus var:)* — This is one of the new upright or columnar flowering crabs, making it especially desirable for planting on narrow streets or for accent or screening on lawns. The tree is a prolific bloomer and flowers are large, 2 inches across, pink fading to light orchid.

When buying hawthornes and flowering crabs for street tree planting, insist on the "STANDARD" or tree forms in contrast to the common shrub forms often used for lawn planting. Avoid the native crabs on the market as they are more susceptible to fire blight and cedar-apple rust. All crabs must be watched for borers and wrapping of trunks on newly planted trees is recommended. Hawthornes may have to be sprayed with FERBAM for cedar-apple rust.

The above is only a partial list of recommended smaller shade tree varieties for city planting.

A PROGRAM FOR STREET TREES

By ORIN F. NOLTING, *Director*
The International City Managers Association, Chicago, Ill.

Many cities are beginning to realize the long-term community value of a municipal program for the control and development of street trees. This is demonstrated by the growing number of cities which have established programs ranging from complete municipal care of street trees to a permit system of street tree regulation. Street trees include all trees located on municipal rights-of-way for streets, boulevards, parkways, and other types of streets.

Street trees provide many benefits which are essential to the welfare of the community. Trees relieve the drabness of streets and provide cooling shade and beauty which greatly enhance living conditions. Trees also help to reduce traffic noises, deflect glare and heat, cut down wind velocities, and purify the air by trapping dust, absorbing carbon dioxide, and releasing oxygen and moisture into the atmosphere. They are conducive to a sense of mental well-being, comfort, and civic pride. No better illustration can be had than a personal comparison of a beautiful tree-lined street with a street that is barren.

Failure on the part of the city to maintain its street trees may result in costly expenditures. Various studies show costs of from $50 to $80 to remove a dead tree. This expense can be greatly reduced through a good tree program. *It is obvious that it is cheaper in the long run to provide proper tree care than to remove those that have died from causes that could have been avoided.* Cities which have ignored the importance of a street tree program have been faced with multiple problems such as crowding of trees because of bad spacing in planting and wrong selection of species resulting in disrupted sewer and water mains, broken sidewalks, interference with street and traffic lighting, and obstruction of overhead utility wires.

Failure to take preventive action against epidemic tree diseases has resulted in the loss of hundreds of thousands of street trees. In one city over 20,000 American elms were reported victims of a virus disease and, according to authorities, the remaining estimated 195,000 elms will undoubtedly die. In another city several years ago 10,000 trees (London Plane) were killed in one year by deadly fungus, the cankerstain disease.

The street tree problem must be approached from a long-range point of view. Many cities are faced with the problem of trees planted too close together and the wrong species of trees, with the result that the growth of tree roots creates serious problems in repairing sidewalks, curb and gutters, and sewer pipes. A long-range program will call for the replacement of street trees with the proper kind of trees, attaining some degree of uniformity along individual streets, and the setting up of an organization and procedures for the proper handling of all stages of street tree work.

A good street tree program calls for careful planning and the realization that the city will have to exercise extensive control. In determining the program, city officials should call upon a qualified professional city arborist who should be relied upon to evaluate the needs of the city and to present recommendations. The professional arborist's work includes a complete street tree inventory and the drafting of a master street tree plan. The plan should include all phases of planting, care, and removal.

The main task of city officials in determining the program will be one of weighing the recommendations of the professional city arborist with the financial capacity of the city to undertake the program. A basic decision that must be made at the outset is the degree of responsibility to be undertaken by the city. The alternatives are: (1) complete responsibility in which the city will do all work on street trees and pay the total cost, (2) limited responsibility under which the city will do some of the work, especially on major thoroughfares, and regulate and supervise street tree work in other areas, and (3) regulation and supervision under which the city will do none of the work or pay any of the cost but merely control the planting, spraying, trimming and removal of street trees under a permit system.

Complete Municipal Responsibility

It is the opinion of professional city arborists that a sound program for street trees calls for complete responsibility on the part of the city. The National Shade Tree Conference, for example, favors the policy of the city assuming complete control of all tree planting, maintenance, and removal practices and recommends that sufficient monies should be provided for such service from general funds or assessments covering the whole city. William B. Love, specialist in municipal forestry and parks, states that: "The ideal street tree program should be set up with the idea in mind that the city will plant, remove, and care for street trees without special assessment against the abutting property. All regulations and work on street trees should be based on the right of the municipalities to control the street for purposes of travel and safety."

Limited Municipal Responsibility

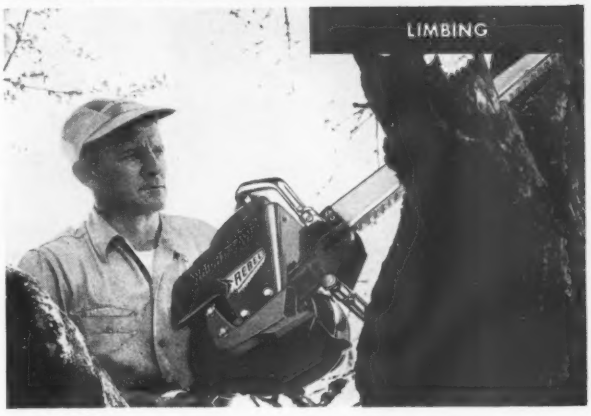
Under a policy of limited responsibility the city would adopt a master street tree plan covering all streets in the city but street tree work would be planned and carried out only on major thoroughfares. On residential streets the city would do work only upon petition of the property owners and make individual charges or assess the cost against abutting property. Under a program of limited responsibility the city would do all the work, either with its own employees and equipment or by private contract, but the cost of the program would be paid by both annual appropriation from general funds and special assessments or charges.

Municipal Regulation

A program of regulation and supervision of street trees is the most limited of the three alternatives. This program may be described as negative in its approach. The city limits itself to prohibiting the planting of certain species of trees and requires all work on street trees to be done by permit only. The city does not work on street trees but merely provides that residents, or persons hired by the resident, obtain a permit to plant, spray, trim or remove street trees. Inspections are made by the city after the work has been accomplished to determine whether the work has met the provisions of the permit.

Any work on street trees done by the city is limited to the removal of dead or diseased trees and trimming of trees which, because of their hazard, may make the city liable for damages. The National Shade Tree Conference considers this program the least acceptable. This association of shade tree experts considers the issuance of permits for certain practices as provided for in ordinances should be considered only as a necessary temporary measure in some cities. The association further states, "The issuing of permits is, in its end result, an unsatisfactory policy."

In the final analysis it would seem that a city should really make a choice between the first two alternatives—a program of complete responsibility or one of limited responsibility. There is in either case a master street tree plan and complete control is exercised by the city. In both instances all street tree work is done by the city but the essential difference between the two programs is that in the first instance the city must undertake all of the cost and in the second the city and the benefited property owners share the cost.



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Reciprocating blade moves back-and-forth like a "powerized" handsaw—166 strokes a second

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F.O.B. Sheboygan, Wis. Includes 20" blade. Price applies in U. S. only. **$189.50**

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Saving Lindens

(Continued from Page 11)

foliage to kill later infestations that might develop from mites which escape the miticide at the time of application.

On the basis of data submitted by Maag, the Director of Horticulture at Zurich decided to make a trail application of Kelthane covering several blocks along the Bahnhofstrasse. The spraying took place in the early hours of the morning (between 1:00 a. m. and 3:00 a. m.) on June 14, 1957, and one hundred and fifty trees were treated during this two-hour period. About fifteen hundred gallons (5800 liters) of spray were applied, using Kelthane EC at a concentration of 0.25%.

Preliminary arrangements for the spraying were made in advance, so that during the actual application the work proceeded without interruption. Electric power was cut off from overhead lines, and traffic was directed so as not to interfere with the operators. The street lights (wired to underground cables) were left on and supplied sufficient illumination for the job.

The Linden in the foreground was not sprayed. Mites have almost defoliated it.

There were no undesirable after-effects from the operation. No complaints were made of odor or objectionable spray deposits, and the general reaction of the residents was one of satisfaction that a solution to the mite problem was being attempted.

Excellent Results

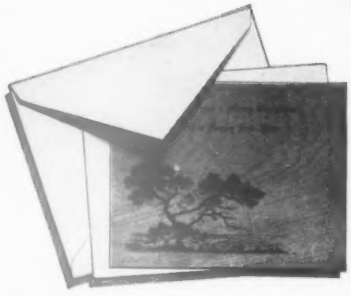
Within a few weeks after the spraying, it was easy to see that the test application had been successful. The foliage on the sprayed trees remained green and in healthy condition, while the lindens outside the test area were soon showing the discoloration typical of mite damage. By late summer many of the unsprayed trees were heavily infested and nearly denuded of their foliage.

The representatives of Maag Company who supervised the trial, made careful counts of the mite population during the weeks before the spraying and at various intervals after the treatment. Control trees, left unsprayed in the test area, provided a reliable check of the effect of the Kelthane spray.

The rapid build-up of spider mites, is shown by the fact that counts made before the spraying rose from 80 mites (and eggs) per ten leaves on May 3, to 570 on June 12. After the treatment, counts made in mid-July showed an average of 10 mites per ten leaves on the sprayed trees and more than 6000 on the untreated trees which were left as controls.

A final count, made in early September (almost three months after the test) showed 450 mites per ten leaves on the sprayed trees and 5500 on the unsprayed lindens. A mite population of 450 that late in the season is of no significance to the appearance or health of the tree. Hence the final result was conclusive: a single application of

(Continued on Page 22)



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Pratt's Sprays are formulated for use in mist blowers or hydraulic sprayers to give the greatest degree of safety and effectiveness for shade trees and evergreens.

PRATT'S 25% DDT (petrolcum solvent) has created an enviable reputation for safety to the trees, even under conditions of heavy application. Correctly balanced for long residual toxicity. This material will stand freezing weather.

PRATT'S X 25% DDT (xylene solvent) is manufactured to meet certain City or State specifications for Dutch elm disease spraying, with or without white oil. Pratt also supplies 32.4% DDT on order.

SCALECIDE—The oldest and best known dormant oil spray. Contains 96% highly refined, highly paraffinic dewaxed oil. Use Scalecide for the control of scale, aphis, red mite, and over-wintering insects on shade trees, fruit trees, evergreens and ornamentals.

PRATT'S SUMMER SPRA-OIL—A miscible 97% white oil type summer oil. For use in the control of red spider, scale crawlers, white fly and as an effective ovicide, also used as a dormant spray for evergreens where a lighter oil is desired.

D-X INSECT SPRAY—One of the most effective non-poisonous sprays for sucking and chewing insects of shade trees as well as fruit trees. Contains rotenone, pyrethrum and piperonyl cyclonene for great effectiveness and safety.

Pratt is basic in Chlordane, Malathion, Lindane, etc.

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The Atlas "Jiffy Stump Cutter" In Action

This stump being removed with a "Jiffy Stump Cutter" is owned and operated by the Goodell Tree Service of Binghamton, N. Y.

Some of the Features of the Atlas Jiffy Stump Cutter are:

Complete unit overall mounted on any ¾ ton pick up truck. Power of operation of this unit is completely motorized by a 37 H.P. Wisconsin Air Cooled Engine.

(1) **Cutting blade head rotates 360°. (Additional cost.)**

(2) **This unit can cut in four different directions.**

(3) **Complete unit from mounting on truck rotates 360°.**

(4) **This unit will reach 7 ft. out and 7 ft. up on an embankment to remove a stump.**

(5) **It will cut 3 ft. below ground level for replanting a new tree.**

(6) **The unit will cut and reach over hedges, stone walls, and fences or crosswalks.**

(7) **The unit can be operated from either side of the truck to prevent blocking of narrow streets.**

(8) **Unit can cut below sidewalk to remove roots that tend to raise walk.**

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Are Downtown Malls Good Business?

Apparently there are two ways for downtowners to feel about the subject of creating a downtown mall or plaza (as in suburban shopping centers). The first way is ice cold to the whole propostion. The second is hotly enthusiastic over the potentialities of the new concept.

This is natural. Pros and cons are always violent in the early stages of any startling innovation. The heat of disagreement brings all the arguments out into the open. We have reported in many past issues on this phenomenon. Now, here is a deeper analysis of the trend.

The most carefully documented and checked mall experience has been in downtown SPRINGFIELD, Ore. Traffic was banned on main street. Side streets were dead-ended and used for parking. Dinner music was broadcast, pony rides arranged, exhibits staged, et cetera. Retail sales "on the mall" were up 14 per cent. Off the mall sales were off 5 per cent. Vehicle traffic was up about 5 per cent but traffic flowed with fewer jams. Among the shoppers *three out of four* wanted the "Shoppers Paradise" mall made permanent. They liked the lack of traffic hazards, shopping convenience, easier parking, safety for children and the relaxed atmosphere. On the negative side, the shoppers complained that the mall was confusing and found fault with the layout of the dead-end parking streets.

The conclusions can probably be stated most simply this way:

1. Businesses located on the mall *liked* the idea and *profited*.
2. Concerns located off the mall felt business was *hurt* and so they *oppose* the concept.
3. The public reaction was heartily *in favor* of the mall. This is probably the most significant factor in the long run.

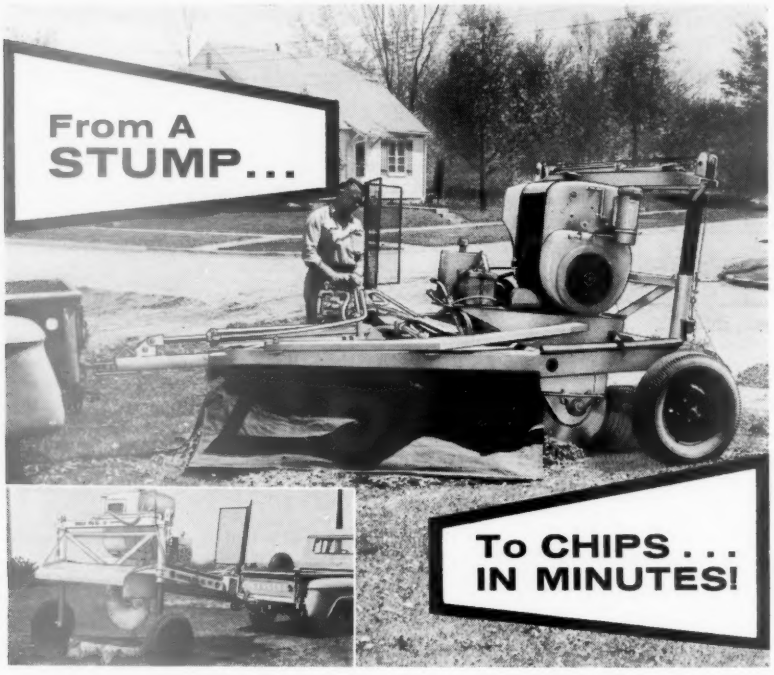
It must be borne in mind that this was a test for just a few days. A true mall was not created and all the parking and traffic routing problems were not worked out. But Springfield is the best experience we have so far.

At least *100* other cities have recently indicated plans to investigate the development of downtown pedestrian malls. OAKLAND, Calif., has already taken beautification steps which will lead in the end to a complete mall. DETROIT plans to relate major expressway construction ultimately with a mall. OLD GREENWICH, Conn., is decorating downtown and working toward the mall. NEW YORK'S Fifth Avenue Association decorated their magic street in mall-like fashion for the celebration of their Golden Anniversary. We have reported on others.

The fabulous Victor Gruen plan for revamping the whole of the downtown FORT WORTH, Texas, has captured the imagination of the world. And, it is all focused on a beautiful plaza encompassing the entire central city. Some impressive financial interests are backing this.

Countless more examples could be cited for cities both very large and surprisingly small. It is obvious that the mall idea can't be ignored. It can be praised or it can be condemned. But it definitely rates serious study and business like evaluation by downtowners.

U. S. Municipal News



Vermeer POW-R-STUMP CUTTER

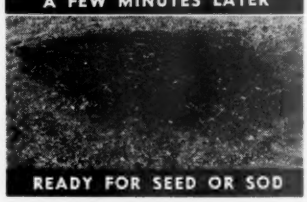
Removes Stumps in Minutes—Not Hours!

Tree Service men and park, recreational and municipal officials all over the country are praising the Vermeer POW-R-STUMP CUTTER. More than an unusual new machine, the Vermeer POW-R-STUMP CUTTER is a revolutionary, new *principle*, that once and for ever has taken the cost, the time and the drudgery of labor out of stump-removal! "From a stump to chips . . . in minutes," is more than a byword, too, it's a fabulous fact. The Vermeer POW-R-STUMP CUTTER removes the largest tree stump—rips it to shreds to a depth of ten inches below the surface of the ground—all in a matter of minutes. One man, only, is required for the whole operation. And when the job is done there's no stump left to be hauled away, no gaping hole to be filled, no rutted lawns, no damaged curbs, driveways or sidewalks.

This is just part of the remarkable story about the Vermeer POW-R-STUMP CUTTER. To get all the details, write—today—for the colorful new FREE folder, just off the press.

AN UNSIGHTLY STUMP

A FEW MINUTES LATER


READY FOR SEED OR SOD

VERMEER MFG. CO. - Pella, Iowa

Tree Flowers

Many people do not realize that all of our common trees have flowers. Otherwise they could not produce seeds.

(Continued on Page 20)

Homelite 8-29 makes cutting 4 ways faster and easier

The Homelite 8-29 chain saw — most powerful one-man chain saw you can own — lets you cut more wood faster and easier four important ways:

1./CUTS FASTER because a brand-new belt drive carries *all* the power to the chain. Greater number of teeth on belt and sprocket reduces tooth load; reduces wear; gives long, trouble-free service life. Smooth-performing belt transmission requires no lubrication, is slip-proof.

2./CUTS EASIER with less vibration and operator fatigue because built-in, automatic, rotary, self-lubricating governor keeps engine running at proper speed, prevents racing or excessive wear. Balanced 29 pounds* lets you cut longer with less strain and effort.

3./CUTS MORE WOOD because new crankshaft permits close coupling of rotary intake valve and governor, allows *full* power to be used. Large, double row ball bearing on clutch end and needle bearings on magneto end support crankshaft with minimum of friction and heat.

4./CUTS EVERYTHING up to 10 feet in diameter. Famous Homelite high-compression, short-stroke engine gets its power from most advanced cylinder design. Large cooling fins provide 12% more cooling area . . . shorter piston stroke cuts wasteful friction, increases engine life, reduces gas consumption.

See for yourself in a free demonstration how the Homelite 8-29 helps you cut more wood faster these four ways. See your nearest Homelite dealer today.

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Tree Flowers

(Continued from Page 18)

We are apt to think of flowering trees as being those with showy blossoms — most of them beautiful and some very fragment—such as the redbud, dogwood, buckeye, horse chestnut, black locust, tulip tree or yellow poplar, magnolia, and the fruit trees.

However, all of our forest and shade trees have flowers — of some kind — which are just as interesting when examined with a strong reading glass. Some are grotesque, some exquisitely designed, some extremely colorful. They offer a new world to be explored and photographed.

Some kinds, such as the elms, bloom profusely but the flowers are so small and delicately tinted that they are seldom noticed. Others, such as the poplars, oaks and walnuts, have peculiar flowers in the form of catkins that, without petals or sepals, do not look like flowers at all. The sycamore's tiny flowers are packed, in countless numbers, into a tight round ball that dangles back and forth on a long flexible stem. The type of flower, where it appears and when it blooms, varies greatly and depends upon the kind of tree.

Certain species, such as the elms, have "perfect" flowers, each with stamens that shed pollen and also a pistil that receives it to fertilize an egg which will develop into a seed. On others, such as the walnuts, there are male flowers (with stamens) and female flowers (with a pistil) borne separately on the same tree. On several—notably willows, cottonwood and other poplars, boxelder, mulberry, Osage orange and sassafras—the male and female flowers are borne on separate trees. Of course, only the females produce seed. There are also species which, on the same tree, not only have "perfect" flowers but, also, either male or female flowers or both. Some of these various kinds of flowers have petals and sepals; some lack one or both of them. All of this may be confusing at first but it will enhance rather than detract from your enjoyment in the study of tree flowers.

Each kind of tree has its own time for blooming. Silver and red maples, elms, cottonwood, aspen and the redbud bloom in early spring, long before their leaves appear. Many trees bloom while their leaves unfold or, like the oaks and hickories, shortly after. A great oak may be so covered with clusters of tassellike catkins that its entire crown has a yellowish or reddish tone. The catalpa, linden and ailanthus bloom last, in June, long after their leaves are fully developed.

Most trees are wind-pollinated and many of them seem to be in a hurry. After discharging their pollen, the flowers wither and soon disappear. Many, however, are pollinated by insects — particularly those with showy flowers—and some, like the black locust and the linden, are so fragrant and laden with nectar that they attract swarms of honeybees.

Every year, in May, when the wild crabapples and hawthorns burst into full bloom, the roadsides and the countrysides around Chicago become indescribably beautiful and fragrant.

Quotes worth Note

excerpts from letters on file in our office.

HELLER-GRO can give you the same results

"... moved over 100 trees—up to 10" caliper ... each tree saturated with **Heller-Gro** when balled ... some caught by extreme frost left balled through winter ... only one lost ... recovery was fast."

"... group of Red Oaks .. completely defoliated by canker worms before we could spray ... coupled with shock of transplanting ... convinced we'd lose trees ... such excellent results with one feeding of **Heller-Gro** ... now include **Heller-Gro** in all feeding programs."

"**Heller-Gro** feeding of Maples proved its merits during drought (1957, New England) ... as trees changed color this fall, Maples fed with **Heller-Gro** were a full 3 weeks later than those not fed ... and leaves stayed on longer."

HELLER-GRO is a complete plant food, U. S. P. ingredients 15-15-15 plus trace elements. Safe. Solution will not burn. Economical paste form, blended by special equipment. Dissolves completely in water for root foliar feeding. Fast-acting and slower-release nitrogen for long growth response.

Write on your stationery for FREE trial sample.

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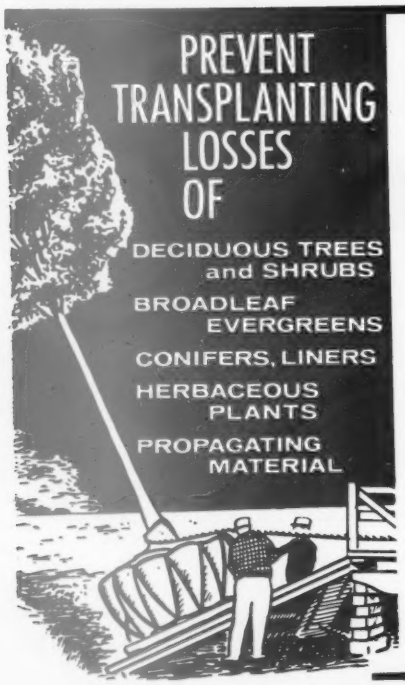

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Plant all year with protection

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Virtually all sizes and varieties of plant material ... from 40 ft. Pin Oaks to small vegetable seedlings ... have been moved successfully even in hottest weather when coated with WILT-PRUF!
Live plants pay dividends ... dead plants profit no one. Keep them alive with Wilt-Pruf.
Wilt-Pruf has many uses ... any new uses you can think of are worth cash to you. Write for contest details!

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New 1958 Asphlund Chipper, 12"—6 cyl.
Used 6 hours—Save $500.00
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Dayton Tree Company
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***ALL* Moving parts**
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***Fingertip Controls so Operator can see his Work and controls the* Operation**

LARGE STUMPS are removed 12" below the ground in minutes

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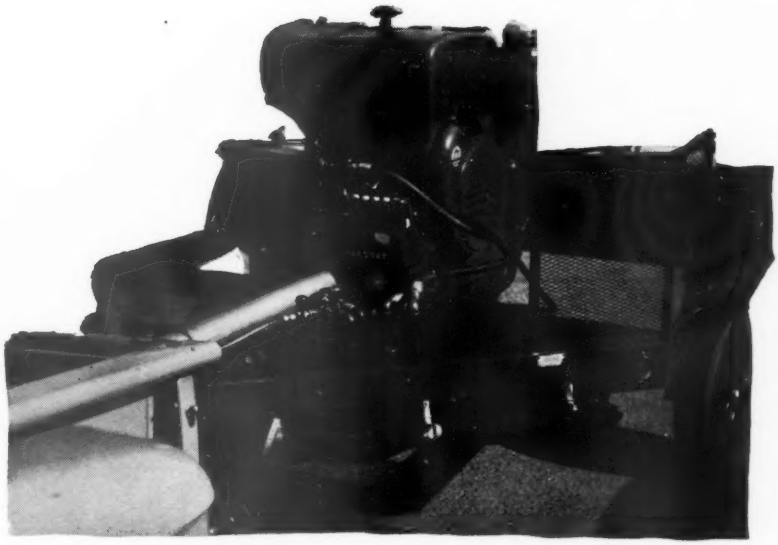

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Dealers interested please
contact FITZHENRY-GUPTILL COMPANY

Saving Lindens

(Continued from Page 16)

Kelthane spray, made in the right way, and at the right time, is a practical and effective means of controlling the linden tree spider mite throughout the entire summer.

The Maag Company

The success of Kelthane on the Bahnhofstrasse mites was gratifying but not surprising to the representatives from Maag Company who directed the work. The recommendation that this potent new miticide be used was based on both experiment and experience, and the company had every reason to expect the results that were obtained. Through the years, this Swiss firm has become well known—in its home country, and through much of Europe—for its careful, scientific approach to problems of agricultural pest control.

Maag Company was founded in 1880 by Rudolf Maag, father of Dr. R. Maag who heads the organization today. The first activity of the firm was the manufacture of fertilizers, and even then research was a feature of the company's operations. Rudolf Maag tested his preparations on "Waisenhof" Farm, and this farm is still used for experimental purposes. However, it is only one of a number of locations where Maag Company now conducts experimental work.

Near the end of the century, when downy mildew became a serious problem in the vineyards of Europe, Maag began producing Bordeaux Mixture—then the only product known for the control of this disease. In 1919 Dr. R. Maag, who had been working abroad as a research chemist, returned to the Dielsdorf plant and began developing other fungicides and insecticides to add to the line. Before long, these products became the company's primary interest, and the manufacture of fertilizers was then discontinued.

Today Dr. R. Maag Ltd., produces chemicals for the control of a wide variety of insects and diseases. It is also a large volume supplier of chemical weed control products and other herbicides, and it makes a line of pigmented wood preservatives.

In addition to its use of Kelthane in formulations for mite control, Maag also employs other agricultural chemicals from Rohm & Haas. The list includes Dithane, Karathane and Perthane.

Dithane Fungicides

Dithane Z-78, zineb-type fungicide, is an ingredient of Maag's Cuprosan. This product has replaced Bordeaux Mixture at Maag, and is widely used in the vineyards of Southern Europe. Dithane M-22, maneb-type fungicide, is the latest addition to the Maag line, used to control phytophthara on potatoes.

Karathane, an organic fungicide of a different type, is outstanding for its positive control of powdery mildew, a fungous organism which attacks many fruits, truck crops and flowers. In addition to its fungicidal properties, Karathane also exhibits miticidal activity against certain mites.

Perthane, an organic insecticide, provides effective control of the cherry fruit fly, and is also used in Maag preparations for the control of European cabbage worm, the cabbage looper, and other pests attacking cole crops or leafy vegetables.

These, and the numerous other products which Maag manufactures or formulates in its big modern plant in Dielsdorf, are used by growers throughout Switzerland. They have solved many troublesome problems in the control of agricultural pests in this area. The successful use of Kelthane in saving the lindens of Bahnhofstrasse from the ravages of the spider mites is but one of many recent achievements to which Maag Company can point with justifiable pride.

$150.00 PER WEEK TO START, for a traveling tree superintendent to supervise tree removal and trimming contracts in New York State primarily; some in Pennsylvania and Ohio. Must be capable of issuing orders to be followed and handling men for maximum work and efficiency. Must be thoroughly experienced in tree work and supervising and familiar with office routine for submission of complete work reports, time sheets. Must be responsible, capable, honest. We will furnish staff car. Hospitalization, vacation, pension plans. Write stating detailed experience, references, pertinent information. MONROE TREE SURGEONS, Inc., 2525 West Henrietta Rd., Rochester 20, New York.

Boron Spray For "Corky-Core"

Connecticut apple growers were warned to spray their trees with boron or risk loss of the remainder of their drought-threatened crop.

Arthur C. Bobb, Extension service pomologist at the University of Connecticut, warned that without additional boron, apples would develop a "corky-core" making them unfit for market.

The corky-core, caused by a boron deficiency, was first observed in the state in 1939. Seventy-five per cent of Connecticut McIntosh and Cortland apples were damaged that year.

Although boron is a vital plant nutrient, it is needed in only very small amounts. But a lack of rain and low soil moisture make it extremely difficult for boron to be absorbed by the roots of the tree, Bobb said.

Applying boron in a spray allows the leaves to absorb sufficient quantities to overcome boron deficient corky-core development in the fruit.

This special boron spray chemical is known as "Polybor-2" or "BoroSpray." It should be applied immediately at the rate of one half to one pound per 100 gallons of water, he said. The half-pound amount can be added to regular spray applications. The one-pound amount should be applied alone.

Laboratory analysis shows that the boron present in apple leaves is only one-third to one-half the amount needed to prevent corky-core.

Extended drought is seriously affecting development and size of apples. Without substantial rains during August, Connecticut's apple crop will be only one-third of that predicted in late June, he said.

IRRITATED STOMACH. Take Juniper berries, roots, ginger, and corriander seed make a tea of this, take a half pint of it.

* * * *

STRENGTHENING FOMENTATION. Take of white-oak bark one ounce, granate peel half an ounce, alum two drachms, water from the smith's slack trough three pints, boil water with the bark and peel to the consumption of one third, then strain the remaining decoction, and dissolve the alum in it.

* * * *

TO MAKE HAIR GROW WHEN IT COMES OUT. Take box wood leaves, and boil them very strong and wash your head every day, and it will make your hair grow again. To keep your hair from coming out, take sassafras and boil it down very strong, strain it, and add sweet oil with the liquor, and boil it until it becomes an ointment, anoint your hair with this and it will make it softe, and not come out.

* * * *

CURE FOR BITE OF DOG NOT MAD. Take the inside bark of an elm tree, and stew it in water until it becomes jelly, then take the bark and jelly, bind it on the wound.

—Thanks to Don Smith, Columbus, O.

FITCHBURG CHIPPER

"OPERATES 1693 HOURS without a breakdown of any kind!"

WELDON S. CAMPBELL
64 MUNSON STREET
GREENFIELD, MASSACHUSETTS

February 4, 1958

Fitchburg Engineering Corporation
Fitchburg, Mass.
Mr. Perini, Superintendent

Dear Sir:

On March 23, 1955, we purchased one of your Chippers. You may be interested to know that this machine operated a total of 1,693 hours without a breakdown of any kind. Inasmuch as we are paid for running time only we often start up the chipper 20 or more times daily.

We have followed faithfully your instructions in using a hone on the knives each morning, we find that by doing this we can use the knives for five weeks before sharpening. Even then only about 12 thousands are needed to bring them back.

Contractors find your chipper is ideal and saves them much time and dollars in clearing a woodland area before bull dozing begins.

Your Engineering skill and knowhow has resulted in the finest of all Chippers and I have seen them all in operation.

Hauling time is reduced two-thirds, this results in a large saving in gasoline, parts and labor. I would never again be without one.

Respectfully,

Weldon S. Campbell
Tree Warden & Moth Supt.
Greenfield, Mass.

Fitchburg Wood Chippers are engineered to stand hard use, to give long service without excessive maintenance costs.

That's the "reason why" successful men like Weldon Campbell prefer Fitchburg for the tough brush removal jobs.

Fitchburg Chippers are designed by engineers for busy, trouble-free service. The exclusive spring-activated feed plate adjusts itself automatically—provides protection from damaging foreign material—assures smooth, efficient operation. The power take-off clutch gives safe starts and stops. There's no fly wheel to cause bearing trouble. These features keep a Fitchburg Chipper on the job . . . save you time and money.

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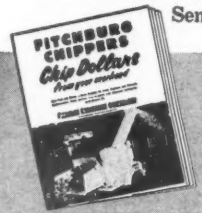

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Portable Electric Sprayer

Insecticide and fertilizer spraying has been made more simple and efficient with a seven-pound "Sprayit 400" portable compressor-type sprayer just introduced by the Electric Sprayit Division of Thomas Industries Inc., Louisville, Kentucky.

The lightweight and easy to operate "Sprayit 400" has the performance features usually associated with heavier and bulkier professional spray units, according to W. L. Tierney, Vice President of Thomas Industries.

"Florists, nurserymen, and others whose business it is to make things grow, whether for business or personal satisfaction, will find the 'Sprayit 400' ideal for quick, efficient dispensing of liquid insecticides and fertilizers," Tierney said.

"The portability of the sprayer and the simplicity of operation are important reasons for its immediate success," he added. "A person can easily hold the compressor with either hand while operating the spray gun with the other. The operator can thereby move quickly from one bush, plant, or tree to another."

The body of the spray gun is of one-piece unbreakable nylon construction and the container is made of aluminum. An adjustable nozzle provides a spray pattern from dime size to a ten-inch fan.

The compressor has an aluminum die-cast body, never needs lubrication, and will operate with any regular extension cord. A thermostatic device in the motor provides overload protection.

The "Sprayit 400" is also ideal for spraying oil, latex base, water-soluble and multi-color paints; stains, lacquers.

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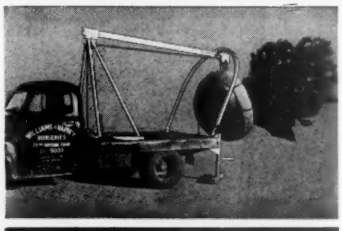

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Authors and Books

The following books may be ordered from TREES Magazine, 7621 Lewis Road, Olmsted, Falls, Ohio.

MAPLES CULTIVATED IN THE UNITED STATES AND CANADA, by Brian O. Mulligan. Published by American Association of Botanical Gardens and Arboretums. Obtain copies from Carl W. Fenninger. P. O. Box 216, Lima, Delaware Co. Penna. 56 pgs. illus. $2.00.

This booklet is a valuable paper containing authenticated data on several hundred cultivated maple species and varieties. There is contained information on geographical distribution, location of plants in arboretums, hybrids, chromosomes and notes on propagation. A guide to where you may see these many fine and unfortunately little known trees in cultivation. The author was assisted in this compilation by twenty-four of the leading arboreta in the United States and Canada. An excellent contribution to the Maples.

* * * *

WINDOW SILL GARDENING, by James Underwood Crockett. Doubleday & Co., Inc.. Garden City, New York. 120 pgs., illus. $2.95.

Everything you need to know about houseplant culture is set down here in simple language, shorn of fancy phrases and complicated directions. This book is equally useful whether you live in the city or country.

It contains information regarding the basic requirements of house plants. There are notes on planting fertilization, repotting, temperatures, watering, exposure (necessary amounts of sun, light, and shade), and bathing. Then there are suggestions on the suitability of various locations in the home.

Mr. Crockett also discusses the pest problem, gas-fume damage, and means of achieving the "good tilth" which is so essential to healthy plant growth. And—worth the price of the book in itself—he gives some commonsense advice on what you can expect from flowers and when to dispose of plants. It is all so helpful, you will feel WINDOW SILL GARDENING was written especially for you.

* * * *

THE ART OF FLOWER AND FOLIAGE ARRANGEMENT, by Anna Hong Rutt. The Macmillan Co., 60 Fifth Ave., New York 11. 248 pgs., illus. $5.95.

"Whether using garden flowers or fruits or foliage, Mrs. Rutt consciously employs the principles and elements of good design. Her words on dominance, or emphasis, will stay long with the arranger as tangible clues to distinctive compositions."

These are the words of Margaret Cochrane Cole, designer in flowers, teacher of flower show judging for the National Council of State Garden Clubs, Inc., and contributing editor on flower arranging for *Flower Grower, The Home Garden Magazine.*

As Mrs. Rutt herself points out, "because there are established principles and elements to understand, those who practice flower arrangement first need to study."

The Art of Flower and Foliage Arrangement is a book that explains perceptively how the principles that are followed in any visual art are the best tools that a flower arranger can have.

"Artistic expression can readily be achieved in even the simplest arrangements," Mrs. Rutt emphasizes. "Flowers and foliage may be selected and arranged so as to evoke a mood or to express with intensity an idea or a theme."

The Art of Flower and Foliage Arrangement attempts not only to help beginners but also to enlarge the understanding of advanced practitioners.

For the student of flower arrangement, Mrs. Rutt builds a background in historic art forms, exemplified by Period arrangements.

In one chapter, steps are given for making ten types of arrangements, including Japanese. Her lucid instructions cover the handling of fresh and dried materials, choice of containers and accessories, and placing of compositions. School children will be encouraged and aided through her chapter on Arrangements by Juniors. Mrs. Rutt also has words of advice that will help exhibitors win awards in flower shows.

The 96 brilliant photographs by Elemore Morgan are among the finest to appear in any book on flower arrangement. All the arrangements were made by the author alone; they are well designed, clean cut, orderly, and expressive.

* * * *

THE AMARYLLIS MANUAL, by Hamilton P. Traub. The Macmillan Co., 60 Fifth Ave., New York 11. 338 pgs., illus. $7.50.

In the North, brightly colored blooms bring cheer to indoor gardens; in the South, brilliant hues enliven the creative gardener's borders and flower beds.

The surprisingly varied members of the genus Amaryllis are among the most resplendent flowers known in cultivation. Their relative ease of culture (given the right conditions) and the remarkable results that can be obtained through hybridization make amaryllis apt subjects for breeding and other research.

In this definitive guide to the fabulous amaryllis, Dr. Traub presents a comprehensive range of information on the culture, ornamental uses, and history of the species.

Whether beginning with seeds, cuttings, bulbs, or full-sized specimens, gardeners will find in this book detailed directions for growing these long-lived plants. With these instructions they will acquire a basic botanical knowledge which will enhance their appreciation and clarify some of their cultural practices.

Arranging, exhibiting, and commercial handling are fully covered along with the latest scientific advances in disease and pest control. The esthetic and educational uses of the genus constitute a compelling chapter.

While the body of the book is devoted to information for the gardener and plant hobbyist, technical discussions for the scientist are developed in the extensive appendices.

Twenty full-page plates of drawings by Allianora Rosse, with a dozen additional half-tones illustrate all of the species and many of the varieties described in the book.

In the words of one advance reviewer, *The Amaryllis Manual* is "an elegant sufficiency for the specialist."

N.A.A. News

(Continued from Page 12)

and were introduced by H. M. Van Wormer, first president of the Association upon its founding in 1938.

Fred H. Claridge, State Forester of North Carolina, was speaker of the evening, his subject being "Trees in the Forest."

Following the talk the new officers were briefly inducted by Past-President George Goodall. The new president, Ray Gustin, presented Henry Vaughn Eames with the Past-President's Award. Attending the dinner were 152 Association members, wives and guests.

Winter Meeting

The winter meeting of the National Arborist Association will be held at Williamsburg, Virginia, February 8, 9 and 10, 1959.

Position Wanted

By City Forester who has B. S. degree in Forestry from Michigan State Univ. 3 years experience with municipal forestry and private arboriculture. Married, one child.
Write Trees Magazine, Box JJI, Olmsted Falls, Ohio

HOBBIES

PAINT OILS: Exciting Home-Courses. Trial Lesson $1.00, specify Landscape, Still-Life, Portraiture or Marine. Prickett-Montague Arbor Studios, Monterey, Massachusetts.

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Position Wanted

City Forester with five years' experience in nursery and city forestry looking for new opportunities and responsibilities. B. S. in Forestry from Purdue University. Married, with three children. Write TREES, Box 5-CIG, Olmsted Falls, Ohio.

TREE SPECIALIST, experienced in diagnosing tree diseases, spraying, estimating removals, trimming, cabling, etc. Forestry training desired. New building, continued business expansion. Vacation-Pension plan. Excellent opportunity for ambitious man. Write age, experience, details.

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Toba Hawthorn
Washington Hawthorn
Pauls Scarlet Hawthorn
Goldenrain
Littleleaf Linden
Crimean Linden
Almira Norway Maple
Cleveland Norway Maple
Ussury Pear
Seneca Sugar Maple (30′)
Hedge Maple
Idaho Locust
Globe Locust
Malus (40 varieties)
Korean Mt. Ash
Flowering Ash (ornus)
Modesto Ash
Blue Ash
Chinese Cork
Pyr. Euro. Hornbeam
Magnolia Loebneri Merrill
Ruby Red Horsechestnut
Baumans Horsechestnut
Imp. Col. Norway M.
Scanlon Red Maple (P.P. #1722)
Gerling Red Maple
Tilford Red Maple
Vesuvius Flowering Plum
Globe. Euro. Ash (7′ stems)
Pyramidal Euro. Ash
Cutleaf Weep. Birch
Texas Oak (40′)
Wineleaf Syc. Maple
Golden Syc. Maple
Pyramidal Syc. Maple
Sycamore Maple
Buisman Elm
Jap. Keaki (Zelkova)
Red Coliseum Maple
Chas. Irish Norway Maple

The Choicest List of Street and Garden Trees In America

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